
Toolkit for inclusive teaching strategies

Index

Module 1

Why do we need inclusive teaching strategies?

Module 2

How to manage the environment for everybody

Module 3

How to give inclusive instructions

Module 4

How to set up inclusive interactions

Module 5

How to better present information for different needs

Module 6

How to differentiate learning online

Module 7

How to build belonging online

Toolkit for inclusive teaching strategies

Why do we need inclusive teaching strategies

Module 1

Index

Start here!

You have six sections to complete in Module 1:

- ◆ Introduction
- ◆ About the 'Toolkit for inclusive teaching strategies'
- ◆ Principle 1: Take a proactive approach
- ◆ Principle 2: Understanding how 'barriers' affect progress
- ◆ Principle 3: A one-size-fits-all approach benefits no one
- ◆ Apply the strategies
- ◆ Put it into practice

Then we recommend you set up a group discussion to:

- ◆ Reflect on this module



Before you begin, we recommend that you get yourself a notebook for taking notes as you work through the toolkit.

Introduction

Why do we need a toolkit for inclusive teaching strategies?

Case study

Before we start, read the case study about Marco.

Do you have any students like Marco in your classes?



Marco is a 14 year-old male student in your class. Marco often arrives late to your lesson with his camera off.

Marco regularly finds it difficult to organise and plan when to do his homework and often doesn't complete the work.

When presenting language, Marco often appears bored or uninterested. He sometimes doesn't appear to understand instructions or tasks.

Marco doesn't enjoy reading long texts but can speak well in class. Marco is sociable, and can be very creative in group settings.

What does the case study tell us about why we need inclusive teaching strategies?

As teachers, I'm sure we agree that the participation, progress and success of all of our learners is important.

But the way our classrooms are traditionally set up (as a 'one-size-fits all' model) means some learners can feel excluded or experience barriers to learning.

Take Marco for example. He's a sociable, creative, talkative teenager, but seems to struggle with organisation and punctuality.

Clearly, something about our approach isn't working for him. How can we help him fulfil his potential?

About the ‘Toolkit for inclusive teaching strategies’

Who is this toolkit for?

This toolkit is designed for language teachers in remote teaching contexts who may be asking themselves...

How can I help learners like Marco to participate more?

How can I support learners with Special Education Needs (“SEN”)?

How can I make my classroom more inclusive?

The focus in the toolkit is on teaching strategies. As teachers, it’s our responsibility to set up the conditions where all learners, like Marco, can succeed and thrive.



Make a note of a question you have about your own remote teaching practice.

How can I _____ ?

How does this toolkit help?

This toolkit aims to provide you with practical strategies to help learners access, participate and progress in your classroom.

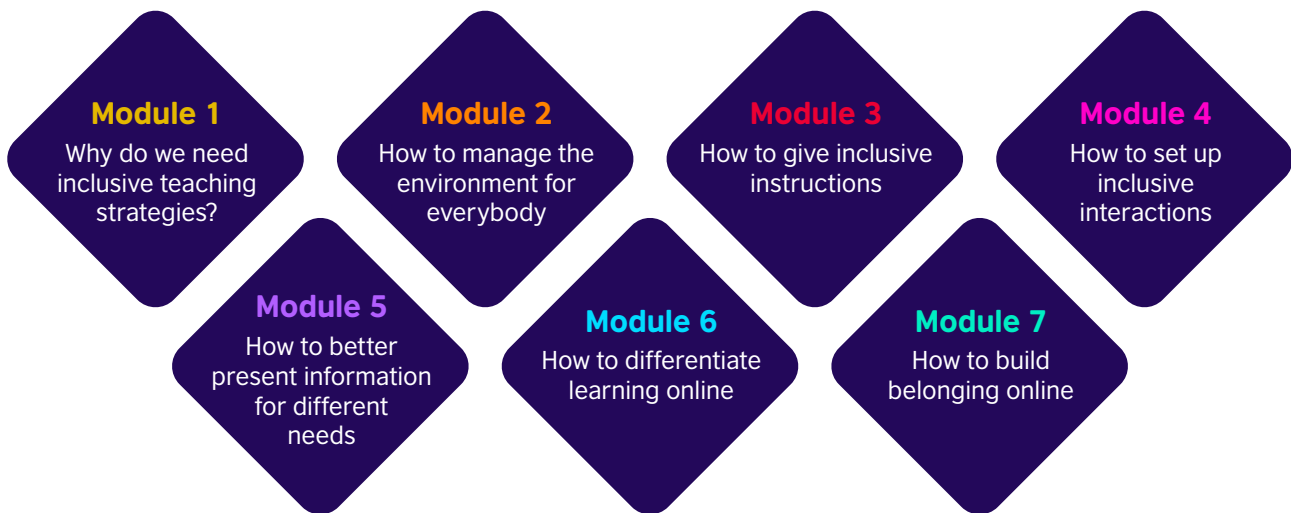
This toolkit has been created with Special Education Needs (“SEN”) at the centre, and borrows many strategies from SEN specific interventions. These strategies will be good for learners with SEN, whether diagnosed or not, and will help remove barriers

that other learners may face for different reasons. By providing a range of ways in which to ‘succeed,’ we can create richer learning experiences for all learners.

You don’t need to be an expert in SEN to create a more inclusive learning environment for learners. In fact, you may have already used some of the strategies we recommend in this toolkit!

How do you use this toolkit?

The toolkit is made up of seven modules, each with principles and strategies for making your practice more inclusive. The modules do not need to be completed in order. Start with the module you feel will be most impactful for your context.



Each module is divided into self-study, application and a group discussion. Throughout each module we encourage you to:

- ◆ **Make notes to use in the small group discussion;**
- ◆ **Try out the strategies in an upcoming lesson;**
- ◆ **Reflect on the benefits and challenges of using the strategies.**

To get the most from this toolkit, we recommend that you partake in a group discussion at the end of each module. A group discussion will help you reflect on the

strategies and your wider teaching practice. Group discussion is a powerful way to share ideas and build a sense of community and accountability around inclusivity at your school. If you're not able to join a group discussion in your context, many of the final activities can also be completed alone as reflection and review tasks.

Speak to the person responsible for professional development training within your organisation to set this up, or self-organise into groups with other teachers who would be interested.

Are you ready to start?

Take out your notebook. As you go through this module, take notes on:

- ◆ What inclusive strategies you already use;
- ◆ Why we recommend these strategies;
- ◆ What other small improvements you can make to create a more inclusive practice in your classroom.

Principles and strategies

Read three principles that help create a more inclusive mindset toward the classroom.

Principle 1: Take a proactive approach

This toolkit takes a proactive approach to inclusivity. By thinking ahead about potential barriers, you will be able to anticipate and plan for the challenges your learners face.

This toolkit will help you create a more inclusive classroom as standard; meaning you are anticipating and planning for needs in advance, rather than having to react impossibly fast when new requirements come to your attention.

A proactive approach to inclusive teaching aims to celebrate diversity in the classroom and can help all learners, including Marco, achieve their potential, despite differences.

By creating more inclusive learning experiences we can reach more learners, move away from practices that are damaging to certain learners, and allow learners to participate more fully.



Before you begin this section make a note on the following questions:

Does your school already have guidelines for inclusive teaching?

If so, do you use them? How?



Prepare to discuss:

How much additional planning do you think it takes to be more inclusive?

What are the consequences for your learners of not adopting inclusive teaching practices?



Principle 2: Understanding how 'barriers' affect progress

A 'barrier' is something that gets in the way of a learner being successful.

An inclusive approach means thinking not only about the classroom or course, but about learners' wider contexts and what barriers they may face.

Learning barriers might be physical, cultural, cognitive, emotional, or system-wide. Potential barriers your learners might be facing could be:

- ◆ lack of access to a device
- ◆ lack of time
- ◆ loud or unstable learning environment
- ◆ low motivation
- ◆ reduced working memory
- ◆ anxiety
- ◆ low confidence
- ◆ lack of previous knowledge.

Many of our activities, tasks and methods feel 'normal' because that's the way we've always done it, but walking in the shoes of our learners can help us surface existing barriers in the traditional models of education.

The online environment may reduce the impact of some barriers (e.g. allowing for self-paced learning, or creating opportunities for new forms of input and output), but it's important to be aware of how different remote learning contexts may affect learners.



Before you begin this section make a note on the following question:

What learning barriers will you encounter (e.g. lack of time, low motivation) as you work through this toolkit?



Prepare to discuss:

What barriers do your learners face in your context?

What has caused these barriers to exist?



Principle 3: A one-size-fits-all approach benefits no one

One-size-fits-all thinking is the idea that there is an 'average learner.'

Throughout history, this kind of thinking has excluded many learners from realising their potential. Understanding, planning for and valuing the variability and neurodiversity of all learners matters.

As teachers we aim to act for the best interests of our learners, but we all come to the classroom with our own biases. Biases can be negative, (for example, 'learners with poor writing skills are less smart') or positive ('I love having learners from X social group. They're always great students!').

Either way, if we use our own abilities and biases (for example, 'learners from this area are better at maths', or 'learners who don't talk a lot aren't as smart') as a starting point for lesson planning, we end up with classes that unintentionally exclude some learners.

The strategies suggested throughout this toolkit aim to shift the focus away from correcting weaknesses, to playing to learners' strengths. When we consider the range of different needs in our classrooms, we anticipate the strengths and diversity of all learners.



Before you begin this section make a note on the following questions:

Do all of your learners learn the same way?

What are some ways in which they are different from each other?



Prepare to discuss:

What are some of the benefits of celebrating diversity in your classroom?

What are some of the challenges?

Check your understanding

Read about four common teaching decisions that may inadvertently cause barriers for your learners.

What possible options, or variations, could you include in your planning to remove or reduce potential barriers?



The teacher has decided to use	Potential barrier faced by learners because of this decision	Possible options or variations to remove or reduce potential barriers
1. A 15-minute timed test	Unable to make decisions fast enough to participate	Set as untimed homework
2. A printed handout	Low vision learner can't adjust size of text	
3. A live class debate	Lack of confidence in speaking, anxious about offering opinions	
4. A written essay task	Learners with phonological processing difficulties	

◆ Example answers:

- 2 Provide digital versions capable of zoom.
- 3 Set as group work with options for participating such as one learner writes, and another speaks.
- 4 Provide different options for output like audio and video.



Nice work. You're done for today! Your next task is to meet your group to discuss your ideas from the module.

Reflect on the module as a group

Welcome to your first group discussion. This is a self-facilitated peer-learning session. Please follow the guide to go through the activities. Nominate a person for each letter A, B, C or D.

When it is your turn, lead the activity by reading the instructions aloud to the group and ask any questions. See below for details of each activity.

Note: *The group discussion is a powerful way to share ideas and build a sense of community and accountability around inclusivity at your school. However, if you're not able to join a group discussion in your context, the activities can also be completed alone as reflection and review tasks.*

Activity leader	Activity name	Time
Teacher A	Check in and introductions	10 minutes
Teacher B	Group review	10 minutes
Teacher C	Case study	15 minutes
Teacher D	Group reflection	15 minutes

Check in and introductions led by Teacher 'A'

Before you begin, prepare for the session with a 'check in'. A check in is a short pause at the beginning of a meeting to reflect on how you feel at this moment.

It might be that you have just had a very stressful class, or maybe you were running late today and feel in a rush. Sharing with the group helps to build empathy. When we have shared we are ready to begin the discussion.

Take a moment to answer the following prompt: Choose a point on the line that shows how you feel today (and why)? Then introduce yourself: tell the group your name and share which point on the weather line you have chosen and why.



Spend about 10-minutes on this section.



For example, I feel like I'm closer to sunshine because I had a great lesson this morning, or my car broke down this morning on the way to work so I'm quite close to the rain cloud.

Review – led by Teacher ‘B’

Choose a principle from the module and take turns and tell each other one or two things about each principle.

- ◆ **Principle 1:** Take a proactive approach;
- ◆ **Principle 2:** Understanding how ‘barriers’ affect progress;
- ◆ **Principle 3:** A one-size-fits-all approach benefits no one.



Spend about
10-minutes
on this section.

Case study – led by Teacher ‘C’

Read the case study about Marco again. Can you recognise any signs that Marco may not be feeling included?

- ◆ Marco is a 14 year-old male student in your class. He often arrives late to your lesson with his camera off.
- ◆ Marco regularly finds it difficult to organise and plan when to do his homework and often doesn’t complete the work.
- ◆ When presenting language, Marco often appears bored or uninterested. He sometimes doesn’t appear to understand instructions or tasks.
- ◆ Marco doesn’t enjoy reading long texts but can speak well in class. Marco is sociable, and can be very creative in group settings.



Spend about
15-minutes
on this section.

Now, discuss the following questions:

1. How do you think Marco feels in the class? What kind of emotions might Marco have when come to class?
2. Have you ever felt like Marco in a learning situation? What were the reasons?
3. Do you have any learners similar to Marco in your class? What strategies do you use?
4. How do you think these strategies would benefit the other learners in your class as well?

Group reflection – led by Teacher ‘D’

Discuss the following reflection questions from the module as a group.

1. In this module you learned about taking a proactive approach. In your context, how much additional planning do you think it takes to be more inclusive? What are the consequences for your learners of not adopting inclusive teaching practices?
2. What barriers do your learners face in your context? What has caused these barriers to exist?
3. What are some of the benefits of celebrating diversity in your classroom? What are some of the challenges?



Spend about
15-minutes
on this section.

If you're interested in this topic check out the links for further reading:

- ◆ Teacher: A one-size-fits-all approach to instruction is stifling our classrooms. (2016). *The Washington Post*. [online] 23 Dec. Available at: <https://www.washingtonpost.com/news/answer-sheet/wp/2016/12/23/teacher-a-one-size-fits-all-approach-to-instruction-is-stifling-our-classrooms>
- ◆ Ciuffetelli Parker, D. and Conversano, P. (2021). Narratives of Systemic Barriers and Accessibility: Poverty, Equity, Diversity, Inclusion, and the Call for a Post-Pandemic New Normal. *Frontiers in Education*, 6. doi:10.3389/feduc.2021.704663. Available at: <https://www.frontiersin.org/articles/10.3389/feduc.2021.704663/full>



Toolkit for inclusive teaching strategies

How to manage the environment for everybody

Module 2

Index

Start here!

You have five sections to complete in Module 2:

- ◆ Introduction
- ◆ Principle 1: Leverage the physical environment
- ◆ Principle 2: Improve communication in the digital environment
- ◆ Apply the strategies
- ◆ Put it into practice

Then we recommend you set up a group discussion to:

- ◆ Reflect on this module



Before you begin, we recommend that you get yourself a notebook for taking notes as you work through the toolkit.

Introduction

What's Module 2 about?

Case study

Before we start, read the quote. Did you feel like Veronica when you started teaching online?



Veronica

Remote teacher.

“My biggest fear with remote teaching was that my learners would be far away in a different environment. I was scared they’d be distracted and I wouldn’t be able to create a rapport with them.”

Why do we need to think about the learning environment?

Your remote classroom is made up of both physical and digital learning spaces. The physical space is where your learners are based, and the digital space is the environment you create in your online classroom. They both contribute to the ‘climate’ of your classroom.

Although we have less control over the physical space, we will look at how to support learners to participate from a range of different physical environments.

We will also look at how you can make your online environment more inclusive.

Are you ready to start?

Take out your notebook.

As you go through this module, take notes on:

- ◆ What inclusive strategies you already use;
- ◆ Why we recommend these strategies;
- ◆ What other small improvements you can make to create a more inclusive practice in your classroom.

Principles and strategies

Read two principles behind making your learning environments more inclusive.

Principle 1: Leverage the physical environment?

What is this principle?

In some remote learning contexts, each learner will be accessing the lesson from a different physical space (e.g. home), but in others all learners will be together in one location (e.g. a classroom).

Before planning your lessons, take some time to think in advance about how the physical and social aspects of the physical environment restrict or support learning.

How does this benefit our learners?

Taking a proactive approach toward the barriers in our learners' physical environments enables us to anticipate and plan for challenges, resulting in a smoother learning experience for all.

Let's read about three different physical learning environments.



Before you begin this section make a note on the following questions:

What is the physical environment of your learners?

Can you think of any challenges caused by their physical environment?



You might want to make a note of possible disadvantages or advantages from your own context.

Physical learning environment 1: Learners studying remotely from the classroom

Possible disadvantages

Noise

Lines of sight of remote teacher

Remote teacher can't see all learners

Audio issues

Lack of interaction

Classroom management

...

Possible disadvantages

Options for live group work and interactions

Learners are already in an established 'learning environment'

Easier access to learning materials

Support mechanisms from school and class teacher

...

Physical learning environment 2: Learners studying at home

Possible disadvantages

Distractions

Interruptions

Isolation

Connectivity issues

Access to device

Domestic duties

Added pressure from family

Privacy issues around use of camera

...

Possible disadvantages

Comfortable

Helps to develop autonomy

Parents or family can help

Relaxed and safe

Able to learn in different environments (bedroom, garden, living room, etc)

...

Physical learning environment 3: Learners studying in a public space (e.g. a library or cafe)

Possible disadvantages

Distractions

Connectivity issues

Noise (e.g. in a cafe)

Social rules, e.g. inability to talk freely in a library

...

Possible disadvantages

Access to more stimuli and 'realia'

Freedom

...

How can you apply this in your online classroom?

Strategy 1 – Plan for interruptions

- ◆ If it's likely that learning will be interrupted (e.g. by poor internet connection, or domestic duties) plan a way to keep learners up to date (e.g. by sharing notes or recording the lesson);
- ◆ If possible, be flexible about when you have breaks to accommodate interruptions;
- ◆ Share ideas and options for when there are interruptions with learners at the start of the session (e.g. 'If internet cuts out, please spend the time journaling on the following topic').

Strategy 2 – Make sure tasks are appropriate to the environment

- ◆ If learners aren't in a good environment for speaking, consider if it's necessary for tasks to be completed all at once, in any particular place. Could they instead submit a video or audio recording, at a later time?
- ◆ If learners are in a noisy classroom, set solitary reading and writing for homework and use the class time to practise communication;
- ◆ Create tasks based on the environment. Involve home or classroom situations in the lessons (e.g. ask people to bring something from their environment to show on camera).

Strategy 3 – Make sure tasks are appropriate to the device

- ◆ What are the tasks your learners are required to do? For example, will learners accessing from phones be required to read a lot of text? If so, you could set the reading task for homework and use the class time for discussion.



Prepare to discuss:

How does the learning environment in your context support or restrict learning?

What barriers do you anticipate before a class?

Principle 2: Improve communication in the digital environment

What is this principle?

Communicating is an essential part of learning a language! The traditional language learning classroom can be an intimidating place for many learners, but online learning can provide ways for learners with low confidence or other learning barriers to communicate in a way that better meets their individual needs or preferences.

How does this benefit our learners?

Online learning can feel isolating for some learners. Encouraging communication and collaboration in the remote classroom can help learners to make connections with their peers and build confidence. Collaborating with learners from different backgrounds also encourages open-mindedness and a sense of belonging, which is especially important in remote learning settings.

Creating an environment with clearer visuals and written communication benefits the access, understanding, and attention of all learners, but can be especially useful for some SEN learners who may struggle with phonological processing.



Before you begin this section make a note on the following question:

What changes to your communication style do you make when moving from the traditional classroom to a remote setting?

How can you apply this in your online classroom?

Strategy 1 – Manage how learners collaborate

Ask yourself these questions to review how well your learners are able to communicate together:

- ◆ Are you able to put learners in groups to collaborate on your platform? (e.g. Does your school's safeguarding policy allow the use of break-out rooms, or chat functions?)
- ◆ Do learners have access to headphones to communicate clearly?
- ◆ What etiquette do you set for muting, responding to others and turn taking?
- ◆ What software can learners access to support collaboration and feedback? (e.g. Google Docs)

Strategy 2 – Improve the clarity of your visual communication

- ◆ Find a presentation, or the learning material for a recent lesson. Review the material using the following visual communication guidelines.



Visual communication guidelines

Text and formatting

Is the text large enough to be read by your learners in their context?

Is your font readable? Some things that allow for general accessibility include:

- ◆ Sans Serif, humanist typefaces
- ◆ letters spaced 0.5 apart
- ◆ approx size 12

Is the layout uncluttered?

Have you used headers where appropriate?

Does the background colour make it easier to read? (To reduce glare between text and page try using a very pale sky blue, or beige).

Images and video

Are images and graphs clear (not crowded)?

Are videos short and clear?

Are closed captions available?

Do the images match the message?

Have you used colours consistently to convey meaning?

Have text and images been designed for ease of processing?

(Note: text is usually processed most easily when it is next to, or underneath, an image. To reduce strain on working memory, avoid placing text over the top of an image, or requiring learners to move back and forth by placing instructions or text and images on separate screens.)

Note: These guidelines have been written with Dyslexic learners in mind but will benefit all learners. This is not an exhaustive list; more information can be found through the The World Wide Web Consortium (W3C) online.



Prepare to discuss:

How can we more effectively involve our learners in the design of our learning environment?



Check your understanding

Read the scenarios with different problems from the learners' environment.

Are any of these scenarios familiar to you?
 What strategies could you use to manage the environment?



Scenario

Possible strategy to manage the environment

You have one learner who accesses the class only from her mobile device. The lesson you've planned involves reading a text and answering questions in small groups.

During the lesson, some learners are having internet connectivity issues, and keep coming in and out of the class.

Learners are accessing the lesson from different environments. Some can talk freely, but one is in a library and unable to talk.

◆ Example answers:

- 1 Ask learners at the beginning of the course what kind of device they will be accessing from. Set reading tasks for homework.
- 2 Give learners options about what to do when the lesson is interrupted, or the connection fails. Provide these options in advance (e.g. by email) in a place they can see without being in the lesson.
- 3 Provide the option to submit answers to speaking tasks before the lesson. Ask learners to listen and respond to the 'silent' learners' responses. Give learners advance notice that the lesson will require a lot of speaking so they can prepare to be in a good location.

Apply to your classroom

Think about an activity that you are planning to do with your class in the next week.

Make notes about:

- ◆ one or two ways you can take advantage of the learners' physical environment in this lesson
- ◆ a change you can make to improve the ways learners communicate.

Make some notes to share with in your group discussion on:

- ◆ the changes you will make
- ◆ the benefits for your learners
- ◆ any challenges you see with using these strategies.



Nice work. You're done for today! Your next task is to meet your group to discuss your ideas from the module.



Reflect on the module as a group

Welcome to your group discussion for Module 2 on managing the environment.

This is a self-facilitated peer-learning session. Please follow the guide to go through the activities. Nominate a person for each letter A, B, and C.

When it is your turn, lead the activity by reading the instructions aloud to the group and ask any questions. See below for details of each activity..

Note: *The group discussion is a powerful way to share ideas and build a sense of community and accountability around inclusivity at your school. However, if you're not able to join a group discussion in your context, the activities can also be completed alone as reflection and review tasks.*

Activity leader	Activity name	Time
Teacher A	Check in and introductions	5 minutes
Teacher B	Group review	10 minutes
Teacher C	Group reflection	15 minutes



Check in and introduction led by Teacher 'A'

Before you begin, prepare for the session with a short 'check in'. A check in is a short pause at the beginning of a meeting to reflect on how you feel at this moment.

It might be that you have just had a very stressful class, or maybe you were running late today and feel in a rush. Sharing with the group helps to build empathy. When we have shared, we are ready to begin the discussion.



Spend about
5-minutes
 on this section.

Look around your environment and find an object near you that represents how your day is going so far. Then, introduce yourself: tell the group your name and share the object you have chosen and why.

Review – led by Teacher 'B'

Choose a strategy and take turns and tell each other one or two things about this strategy.

- ◆ Leverage the physical environment;
- ◆ Improve communication in the digital environment.



Spend about
10-minutes
 on this section.

Reflection – led by Teacher 'C'

Discuss the following reflection questions from the module as a group.

- ◆ How does the learning environment in your context support or restrict learning? What barriers do you anticipate before a class?
- ◆ How can we more effectively involve our learners in the design of our learning environment.



Spend about
15-minutes
 on this section.

If you're interested in this topic check out the links for further reading:

- ◆ W3.org. (2008). *World Wide Web Consortium (W3C)*. [online] Available at: <https://www.w3.org>
- ◆ British Dyslexia Association (2018). *Dyslexia friendly style guide*. [online] British Dyslexia Association. Available at: <https://www.bdadyslexia.org.uk/advice/employers/creating-a-dyslexia-friendly-workplace/dyslexia-friendly-style-guide>
- ◆ eLearning Industry. (2017). *4 Tips To Combine Text And Graphics For Better eLearning*. [online] Available at: <https://elearningindustry.com/4-tips-combine-text-and-graphics-for-better-elearning>



Toolkit for inclusive teaching strategies

How to give inclusive instructions

Module 3

Index

Start here!

You have six sections to complete in Module 3:

- ◆ Introduction
- ◆ Principle 1: Prepare for instruction delivery
- ◆ Principle 2: Provide scaffolding
- ◆ Principle 3: Use narratives and advance organisers
- ◆ Apply the strategies
- ◆ Put it into practice

Then we recommend you set up a group discussion to:

- ◆ Reflect on the module



Before you begin, we recommend that you get yourself a notebook for taking notes as you work through the toolkit.

Introduction

What's Module 3 about?

Case study

Before we start, read the quote.

Do you have any students in your class like Mateo?



Mateo
Student.

“Sometimes when I’m in a class, I get lost. I mix up the instructions or do things in the wrong order as I usually only remember the first or last part of what I’m supposed to do.

I feel confused when the rest of the class understands what to do. I don’t know what I’m doing wrong!”

Why do we need to give more inclusive instructions?

The principles for giving clear instructions are the same in the online classroom as the traditional one, but learners may face different barriers in an online environment (e.g. teachers might struggle to read learner expressions through on a screen, or learners might not have the same opportunity to ask clarifying questions). Through a screen it can be more difficult to gauge whether something has been misunderstood, or if learners are on task.

Taking the time to prepare instruction delivery in advance, scaffolding tasks and using class outlines can help all learners to understand the upcoming tasks.

In this module, you’ll read three principles behind making your instructions more accessible and inclusive for all learners, and strategies to use in your upcoming classes. The strategies in this module are especially helpful for learners with attention or organisation challenges, who may struggle like Mateo to hold the instructions in their working memory

Are you ready to start?

Take out your notebook.

As you go through this module, take notes on:

- ◆ What inclusive strategies you already use;
- ◆ Why we recommend these strategies;
- ◆ What other small improvements you can make to create a more inclusive practice in your classroom.

Principles and strategies

Read three principles behind making your instructions more accessible and inclusive for all learners

Principle 1: Prepare for instruction delivery

What is this principle?

When we haven't planned what to say regarding instructions and how to say it, we can compromise the success of the lesson! Taking a proactive approach to instruction delivery is a simple way to ensure your instructions are more inclusive.

While communication challenges can arise from the online learning environment, it can also offer opportunity for instruction delivery that may work in favour of some learners.

Prepare for instruction delivery by thinking in advance about the specific challenges your learners face and considering how to take advantage of online resources. Make notes about the possible barriers in your context (e.g. noisy environment, attention span, amount of information) and how you'll overcome them.

Your strategy will differ if your learners are all present in the same remote location, vs if your learners are on individual devices.

How does this benefit our learners?

All learners will benefit from well considered instructions. Anticipating barriers like working memory difficulties, lack of focus or poor internet connection means we can plan strategies in advance.



Before you begin this section make a note on the following questions:

Do you find time to prepare your instructions in advance?

If so, what kind of preparation do you do?



How can you apply this in your online classroom?

Strategy 1 – Make use of any available technology

- ◆ If demonstrating tasks on a browser, zoom in to highlight the relevant tasks;
- ◆ Customise your mouse pointer to be big and brightly coloured so that learners can see where you are pointing on the screen during instructions;
- ◆ Turn on live captions;
- ◆ Use speech-to-text software;
- ◆ Try filming your instructions and share with learners in advance.

Strategy 2 – Make your delivery multisensory

- ◆ Have a space where instructions are always visible. For example, 'pin' instructions to the top of the screen or put them in the chat;
- ◆ Use electronic timers to show timings;
- ◆ Use images and colours to make the message clear. When using colours, be consistent with their meaning and be aware of the impact on learners with vision impairments. For example, an image of a clock with different minute sections coloured differently;
- ◆ Learners with attention difficulties can try to hold something in their hands to fiddle with while listening to instructions. This will improve their listening skills.

Strategy 3 – Make time for learner feedback and to check understanding

- ◆ Giving instructions remotely may take longer. Save enough time for concept checking and questions;
- ◆ Ask learners to repeat instructions to each other, or answer questions about the upcoming task to confirm that the message is clear;
- ◆ Create an environment where learners are easily able to say if they don't understand. Provide space for learners to ask questions privately if required;
- ◆ Put learners into break-out rooms so they can talk to, and support each other with tasks.



Prepare to discuss:

Can you remember a time you weren't clear on what was expected of you?

How did you feel?

Principle 2: Provide scaffolding

What is this principle?

Scaffolding is the support provided by a teacher while learners learn new ideas and skills.

At the beginning of the instructional scaffolding process, teachers provide a lot of support, often demonstrating how to solve a problem or task, then gradually letting learners solve the problem themselves. This is sometimes referred to as 'I, We, You' modelling.

When modelling, it's important for the example to show not only the exemplary work, to show learners what the product should look like, but also to describe the steps that are required to get there.

How does this benefit our learners?

Scaffolding helps learners to become more independent in their learning, as they are gradually encouraged to work through tasks autonomously which helps to build confidence and enables learners to create their own learning strategies.

Understanding verbal instructions can be demanding on working memory. Instructional scaffolding and modelling can also provide additional support to learners with executive functioning difficulties (including SEN students).



Prepare to discuss:

What signs could you look for in your learners to see that they're becoming more independent learners?



Before you begin this section make a note on the following question:

What changes to your communication style do you make when moving from the traditional classroom to a remote setting?

How can you apply this in your online classroom?

Always show learners the outcome or product before they do it and provide reasoning about why this example is successful.

Strategy 1

Use a screenshot of the online task while modelling. Highlight on the screenshot the relevant sections for learners and make notes or reveal instructions on the screen while giving instructions to model how to complete the task and why each stage is important.

Strategy 2

Record yourself (with your phone, or screen capturing software like Loom) setting the task or modelling a process (like in strategy 1). This could be done before a class or, if short of time, record yourself live during the lesson. Share this recording during, or after the class to be studied as a worked example (see Module 4 to read more about worked examples).

Principle 3: Use narratives and advance organisers

What is this principle?

A major problem that learners have is staying focused during a lesson. To stay on task, many of our learners need to understand the 'big picture' of what they are learning and why it is relevant.

One way to show learners the big picture is by framing your instructions with an 'advance organiser'. This is a framework to help learners to understand what they're about to do and how it fits together.

An advance organiser can take different forms, and you're probably already using advance organisers. For example, simply using an agenda that shows the activities in class can help to keep focus.

To help show why a lesson is relevant, begin with 'the point' or reason for the class.

When preparing instructions, have a set of 'why's' ready to provide the point of each stage to help learners see the big picture more clearly.

How does this benefit our learners?

Showing the big picture and point of the lesson at the instruction stage can be helpful to all learners, as it builds motivation. It is especially helpful to learners who struggle with organisation and attention, and therefore may lose track of why they are completing a specific task.



Prepare to discuss:

How might you help learners organise and document their thinking in your context?



Before you begin this section make a note on the following question:

Think about a learner in a recent class who wasn't able to stay focused during the lesson... What are some reasons why they may have appeared that way?

How can you apply this in your online classroom?

Strategy 1

Use an online 'board' that you can share with students to show the agenda and reasons for the lesson. This could be as simple as sharing a slide or written document.

Strategy 2

Create an online board or use a digital project management platform where you can move things from 'to do' to 'done'.

Check your understanding

Draw a line between the principle, strategy and benefits to make groups. Include one strategy, one principle and one benefit for each group.

Then make a note for each group with an idea of which learners in your class would benefit from this, or a challenge you see with using this strategy.



Principle	Strategy	Benefit
1. Prepare for instruction delivery	a. Use a screenshot of the online task while modelling. Highlight relevant sections and make notes to model how to complete the task and why each stage is important.	a. Using an advance organiser, or agenda in the lesson can be especially helpful to learners who struggle with organisation and attention to understand why they are completing a specific task.
2. Provide scaffolding	b. Use a digital board where learners can see you moving things from 'to do' to 'done'.	b. Anticipating barriers like working memory difficulties, lack of focus or poor internet connection means we can plan.
3. Use narratives and advance organisers	c. Find out what available technology you can use to help learners understand instructions better in your context.	c. This helps to build confidence and enables learners to create their own learning strategies.

◆ Answer:
1,c,b. 2,a,c. 3,b,a.

Apply to your classroom

Think about an activity that you are planning to do with your class in the next week. Make notes about:

What changes can you make to the instructions to:

- ◆ prepare for instruction delivery
- ◆ provide scaffolding
- ◆ use narratives and advance organisers

Make some notes to share with in your group discussion on:

- ◆ the changes you will make
- ◆ the benefits for your learners
- ◆ any challenges you see with using this strategy



Nice work. You're done for today! Your next task is to meet your group to discuss your ideas from the module.



Reflect on the module as a group

Welcome to your group discussion for Module 3 on inclusive instructions. This is a self-facilitated peer-learning session. Please follow the guide to go through the activities. Nominate a person for each letter A, B, and C.

When it is your turn, lead the activity by reading the instructions aloud to the group and ask any questions. See below for details of each activity.

Note: *The group discussion is a powerful way to share ideas and build a sense of community and accountability around inclusivity at your school. However, if you're not able to join a group discussion in your context, the activities can also be completed alone as reflection and review tasks.*

Activity leader	Activity name	Time
Teacher A	Check in and introductions	5 minutes
Teacher B	Group review	10 minutes
Teacher C	Group reflection	15 minutes



Check in and introduction led by Teacher 'A'

Before you begin, prepare for the session with a short 'check in'. A check in is a short pause at the beginning of a meeting to reflect on how you feel at this moment.

It might be that you have just had a very stressful class, or maybe you were running late today and feel in a rush. Sharing with the group helps to build empathy. When we have shared, we are ready to begin the discussion.

Take a moment to look at the colour line. Choose a colour that represents how you are feeling today. Then introduce yourself: tell the group your name and share which colour you have chosen and why.



Spend about
5-minutes
on this section.

Review – led by Teacher 'B'

Choose a strategy and take turns to tell each other one or two things about this strategy.

- ◆ Prepare for instruction delivery;
- ◆ Provide scaffolding;
- ◆ Use narratives and advance organisers.

For example:

Since reading the module, have you used any of the strategies?

Do you have any more examples of how this principle can be applied in the online classroom?

Have you used any of these in your online classroom? Was it successful?



Spend about
10-minutes
on this section.

Reflection – led by Teacher 'C'

Discuss the following reflection questions from the module as a group.

- ◆ Can you remember a time you weren't clear on what was expected of you? How did you feel?
- ◆ What signs could you look for in your learners to see that they're becoming more independent learners?
- ◆ How might you help learners organise and document their thinking?



Spend about
15-minutes
on this section.

If you're interested in this topic check out the links for further reading:

- ◆ Shaw, A. (2019). *Scaffolding Learning in the Online Classroom*. [online] Center for Teaching and Learning | Wiley Education Services. Available at: <https://ctl.wiley.com/scaffolding-learning-in-the-online-classroom>
- ◆ Teaching.temple.edu. (n.d.). *Advance Organizers: Setting the Stage for Learning and Retention* | Center for the Advancement of Teaching. [online] Available at: <https://teaching.temple.edu/edvice-exchange/2022/04/advance-organizers-setting-stage-learning-and-retention>



Toolkit for inclusive teaching strategies

How to set up inclusive interactions

Module 4

Index

Start here!

You have six sections to complete in Module 4:

- ◆ Introduction
- ◆ Principle 1: Include collaboration
- ◆ Principle 2: Help learners interact more easily with the learning materials
- ◆ Principle 3: Balance ‘listening’ and ‘doing’
- ◆ Apply the strategies
- ◆ Put it into practice

Then we recommend you set up a group discussion to:

- ◆ Reflect on the module



Before you begin, we recommend that you get yourself a notebook for taking notes as you work through the toolkit.

Introduction

What's Module 4 about?

Case study

Before we start, read the case study about Olivia.

Do you have any students like Olivia in your classes?



—
Olivia usually dreads the end of term projects, as she struggles with getting her ideas down.

—
But this term, her teacher put Olivia into a team with two other students.

—
Olivia researched the ideas and shared back with her team. After a group discussion, her teammate wrote out the detailed part and Olivia took responsibility for presenting in front of the class.

—
Olivia really enjoyed this project because she felt useful and valuable.

Why do we need need to set up inclusive interactions?

One way we can think about 'learning' is as a series of interactions. In the online classroom, your learners interact with:

- ◆ you (the teacher);
- ◆ other learners;
- ◆ the learning materials;
- ◆ as a whole classroom.

All these interactions contribute to a learner feeling successful in the online classroom. In this module we'll look at how to set up your online environment to allow for more inclusive interactions. The strategies in this module are especially helpful for learners with executive function challenges who, like Olivia, may benefit from group work.

Are you ready to start?

Take out your notebook. As you go through this module, take notes on:

- ◆ What inclusive strategies you already use;
- ◆ Why we recommend these strategies;
- ◆ What other small improvements you can make to create a more inclusive practice in your classroom

Principles and strategies

Read three principles that help create more inclusive interactions in the classroom.

Principle 1: Include collaboration

What is this principle?

Collaboration allows learners with different abilities and strengths to support the development of each other. This could be in pairs or larger groups.

Collaborative learning allows learners to put together their thoughts and abilities, listen actively and consider each other's ideas and opinions.

In any type of group work, students must agree on who will handle different parts of a project and work together using each other's strengths to complete the tasks.



Before you begin this section make a note on the following questions:

Can you think of an example where you worked well in a team?

What made that collaboration successful?

How does this benefit our learners?

Group work in the classroom mimics what happens in real life. When we work in groups, we can take on different roles that suit us better. Often, more learners than we realise have low self-esteem about their abilities. Group work allows learners to explore what they're good at, while also celebrating success as a team.

Well-structured group work can benefit:

- ◆ lower-level learners who benefit from mentoring and support
- ◆ SEN students who may enjoy sharing ideas, but find reading and writing a challenge
- ◆ higher level learners by giving the opportunity to further consolidate what they've learned.



How can you apply this in your online classroom?

Strategy 1

Not everyone is immediately comfortable with working in groups. Support learners by creating expectations for optimal group and peer work (e.g., participating toward the same goal, options for different roles).

Strategy 2

Give learners sentence stems they can use to help interact as a group in English ('Can you help me X', or 'Why don't we try X?'). Share examples of positive interactions that you observe during and/or after.

Strategy 3

Make groups with different strengths and abilities and assign clear goals, roles, and responsibilities. If possible, use break-out rooms.

Strategy 4

Set simple tasks for learners to collaborate. For example, review notes, study, read aloud, or complete a project like creating an online poster together on Google docs, or another online tool.



Prepare to discuss:

What is the layout of your online learning environment?

How does the current layout create, or prohibit opportunities for connection and collaboration?



Principle 2: Help learners interact more easily with the learning materials

What is this principle?

In the classroom, we often give our learners one kind of 'input' but expect another 'output' from them. For example, we might use verbal instructions to describe how we want a written task to be done.

Try using an example or a model to show what kind of output we expect. This allows all learners to understand more clearly what they need to produce.

How does this benefit our learners?

Our brains naturally vary from person to person. This means that a simple and easy task for one learner may be a huge challenge to another.

One way that we are different is in our executive functions. These are like the management system of our brain (e.g., responsible for processing and planning). By providing samples of completed work, this can help your learners to understand expectations and plan accordingly.

In any classroom there will be diversity in executive functioning skills. SEN students with ADHD or Dyslexia may show reduced ability to recall and process information. Any learner's executive functioning could be affected by mood, fatigue, and the learning environment - meaning we all benefit by viewing samples of expected output.



Prepare to discuss:

Providing a model or sample was a solution originally designed for SEN students, however we now know that this strategy has benefits for all learners. This is an example of a solution that originally solves a problem for a minority group of learners but has a benefit across the majority of the class.

What other examples of this have you seen in your lessons?



Before you begin this section make a note on the following question:

Have you ever been given an instruction but not been sure what you needed to do?

Can you remember what caused this to happen?

How can you apply this in your online classroom?

Strategy 1

Give learners a model or example of the task to work from that helps them to explore and understand. This can be emailed or sent in advance, or during the class.

Strategy 2

Give learners any verbal instructions in written form. For example, copy paste your instructions into the chat box for learners to read or as you go through the task, screen share a slide with the instruction text written down.

Principle 3: Balance 'listening' and 'doing'

What is this principle?

When creating your lesson plans, think about the balance of interactions happening throughout. Try to balance oral presentations with visual information and activities, and passive tasks with active tasks. You should also consider the balance between large group, small group, and individual activities.

How does this benefit our learners?

Another example of an executive function is 'working memory'. Working memory is where the brain temporarily holds any information needed for a task currently being worked on. That is, listening to, remembering, and following directions that contain multiple steps. For example, doing the steps for a recipe when no longer looking at the recipe.

By balancing listening and doing, you can respect the limits of working memory. Your learners will have the opportunity to apply new knowledge, practise new skills and reinforce their learning.

Everyone benefits from varied interactions in the classroom. As our brains can only process a certain amount of information at a time, when we are overloaded, our ability to learn decreases, and we become disengaged.



Prepare to discuss:

Make a list of the interactions you had in your most recent lesson.

Read your list - how many of the interactions in your classroom reflect what happens in real life?



Before you begin this section make a note on the following question:

Think about a learner in a recent class who appeared bored or disengaged... What are some reasons why they may have appeared that way?

Poor working memory can affect all your learners. However, you will notice that students with SEN will particularly benefit from opportunities to directly apply new knowledge.

How can you apply this in your online classroom?

Strategy 1

When planning the lesson, create a column to make a note of the interaction (listening, solo work, peer work, group discussion) happening at each stage. Is there a balance?

Strategy 2

Plan your lesson starting with what you want the learners to be able to do or say at the end of the lesson. Then, review any oral teaching presentations so that you only include essential information for that task.

Check your understanding

Draw a line between the principle, strategy and benefits to make groups. Include one principle, one strategy, and one benefit for each group.

Then make a note for each group with an idea of which learners in your class would benefit from this, or a challenge you see with using this strategy.



Principle	Strategy	Benefit
1. Use worked examples as part of your input and instruction to learners	a. Using visual aids for a short teacher-led language presentation. Then give learners a task to apply what they've learned.	a. Assist working memory by applying new knowledge immediately.
2. Balance the interaction between 'listening' and 'doing'	b. Using break-out rooms or collaborative tools like Google docs for collaboration.	b. The cognitive effort needed to understand how to do the task is reduced.
3. Include collaboration	c. Typing or showing instructions on the screen as you say them. Showing a sample of expected work (e.g., dialogue). Send this to learners so they can process in their own time.	c. Learners learn from each other and experience success as a team.

◆ Answer:
1,a,b. 2,c,a. 3,b,c.

Apply to your classroom

Think about an activity that you are planning to do with your class in the next week. Make notes about:

What changes can you make to the instructions to:

- ◆ improve collaboration
- ◆ make it easier for all students to interact with the materials
- ◆ balance 'listening' and 'doing'

Make some notes to share with in your group discussion on:

- ◆ the changes you will make
- ◆ the benefits for your learners
- ◆ any challenges you see with using this strategy



Nice work. You're done for today! Your next task is to meet your group to discuss your ideas from the module.



Reflect on the module as a group

Welcome to your group discussion for Module 4 on inclusive interactions. This is a self-facilitated peer-learning session. Please follow the guide to go through the activities. Nominate a person for each letter A, B or C.

When it is your turn, lead the activity by reading the instructions aloud to the group and ask any questions. See below for details of each activity.

Note: *The group discussion is a powerful way to share ideas and build a sense of community and accountability around inclusivity at your school. However, if you're not able to join a group discussion in your context, the activities can also be completed alone as reflection and review tasks.*

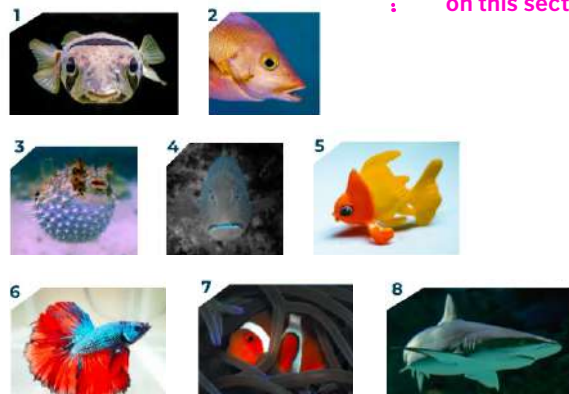
Activity leader	Activity name	Time
Teacher A	Check in and introductions	5 minutes
Teacher B	Group review	10 minutes
Teacher C	Group reflection	15 minutes

Check in and introduction led by Teacher 'A'

Before you begin, prepare for the session with a short 'check in'. A check in is a short pause at the beginning of a meeting to reflect on how you feel at this moment.

It might be that you have just had a very stressful class, or maybe you were running late today and feel in a rush. Sharing with the group helps to build empathy. When we have shared, we are ready to begin the discussion.

Take a moment to look at the picture with the different fish. Choose a fish that represents how you are feeling today. Then, introduce yourself: tell the group your name and share which fish you have chosen and why.



Spend about 5-minutes on this section.

Review – led by Teacher ‘B’

Choose a strategy and take turns and tell each other one or two things about this strategy.

- ◆ Collaboration;
- ◆ Using worked examples;
- ◆ Balance ‘listening’ and ‘doing’.

For example:

*Do you have any more examples of how this principle can be applied in the online classroom?
 Have you used any of these in your online classroom? Was it successful?*



Spend about
10-minutes
 on this section.

Reflection – led by Teacher ‘C’

Discuss the following reflection questions from the module as a group.

- ◆ What is the layout of your online learning environment? How does the current layout create, or prohibit opportunities for connection and collaboration?
- ◆ Providing a model or sample is a solution originally for SEN students, however we now know that this strategy has benefits for all learners?

This is an example of a solution that originally solves a problem for a minority group of learners but has a benefit across the majority of the class. What other examples of this have you seen in your lessons?

- ◆ Make a list of the interactions you had in your most recent lesson. Read your list – how many of the interactions in your classroom reflect what happens in real life?



Spend about
15-minutes
 on this section.

If you're interested in this topic check out the links for further reading:

- ◆ [www.youtube.com](https://www.youtube.com/watch?v=-iccWRhKZa8). (n.d.). *Kat Holmes: Rethink What Inclusive Design Means*. [online] Available at: <https://www.youtube.com/watch?v=-iccWRhKZa8>
- ◆ Duckworth, A. (2021). *Why Teamwork in Class Builds Competence and Confidence (Opinion)*. [online] Education Week. Available at: <https://www.edweek.org/teaching-learning/opinion-why-teamwork-in-class-builds-competence-and-confidence/2021/02>



Toolkit for inclusive teaching strategies

How to help learners engage with information

Module 5

Index

Start here!

You have six sections to complete in Module 5:

- ◆ Introduction
- ◆ Principle 1: Break down information
- ◆ Principle 2: Show the big picture of the lesson
- ◆ Principle 3: Activate the different senses
- ◆ Apply the strategies
- ◆ Put it into practice

Then we recommend you set up a group discussion to:

- ◆ Reflect on the module



Before you begin, we recommend that you get yourself a notebook for taking notes as you work through the toolkit.

Introduction

What's Module 5 about?

Case study

Before we start, read the story from Claire, an ELT teacher.

What does this example tell us about information processing and memory?



Claire
EL teacher.

'I remember a class where I was having difficulty teaching my students a vocabulary list. During the break, I heard some students singing along to a popular song. It gave me a great idea! I found the instrumental version online, and for the rest of the lesson, the students made new lyrics to the song with the challenging vocabulary. Needless to say, the whole class did very well on the next module test!'

Why do we need to help learners engage with information better?

As teachers, we want our learners to make connections, and more deeply understand information. But often the way material and information is presented (e.g. large blocks of text) can create barriers (e.g. processing difficulties) for our learners.

The online classroom can offer a rich variety of ways of helping learners to engage with new information, in ways that make sense for the diverse range of learners.

In this module, you'll read about three principles to help learners better engage with information in your

online classroom, and three takeaway strategies you can use in your upcoming classes.

Note: This module focuses on task design. Additional information on how to visually present information to make it more engaging can be found in Module 2.

Are you ready to start?

Take out your notebook.

As you go through this module, take notes on:

- ◆ What inclusive strategies you already use;
- ◆ Anything you hadn't considered before;
- ◆ What other small improvements you can make to create a more inclusive practice in your classroom.

Principles and strategies

Read about three principles that lead to your learners feeling more engaged and the strategies for using them in your classroom.

Principle 1: Break down information ('chunking')

What is this principle?

Breaking down (or 'chunking') information into smaller, more manageable, or meaningful pieces or groups makes it easier to process or hold in our working memory. The idea is that when information is delivered in chunks, we remember more.

Working memory is the small amount of information that can be held in our minds. It's commonly said that we can only hold between 3 to 5 bits of information in our working memory at any given time.

You can think of chunking both in the way you present information to learners, for example breaking down lessons into bite size pieces, and in how you design activities for learners.

How does this benefit our learners?

All learners (not only those with working memory difficulties!) benefit from chunking and creating groups to help processing information.

Chunking helps with comprehension of new information. Learners creating their own groups, or categories of information can extract their own meaning from the chunks of information.



Before you begin this section make a note on the following question:

Read this number and try to remember all the digits: 8467452.

Now read this number and do the same: 846-7452.

Which option was easier to remember? Why?



How can you apply this in your online classroom?

Strategy 1

For an online chunking activity, research and find a tool that works for your classroom to allow learners to break down and sort information digitally. For example, an online 'whiteboard' tool (like Google's Jamboard or Miro), or a collaborative document like Google docs where learners can easily move information around.

Give learners the opportunity to categorise the information themselves. Paste the information into the platform, and let learners edit it to create their own groups, or chunks. This could work with new vocabulary, or prefixes, suffixes, lexical chunks etc.



Prepare to discuss:

Working memory, emotions, noise and distractions can be barriers to our ability to engage with information effectively.

Can you think of a time when your learners have experienced more than one barrier at the same time? What barriers were they?

What was the impact of facing multiple barriers?

Principle 2: Show the big picture of the lesson

What is this principle?

Even with well-chunked information, sometimes a lesson can feel like a jumble of unrelated parts to a learner. We benefit from seeing the 'big picture', or narrative of a lesson and how each chunk, or stage, of learning connects to the one before, and the one after.

By explicitly showing the building blocks, and how they are connected you're helping to aid understanding by making your lessons build on each other. Support learners to know what is happening and to organise themselves.

How does this benefit our learners?

All learners learn better through forming connections as tying different things together builds understanding.

Learners with dyslexia especially benefit from seeing the 'big picture'. This can mean seeing how the information presented is cumulative (builds on each other), sequential (in a logical sequence) and the overall narrative.



Prepare to discuss:

Have you ever felt lost, or confused while learning a new topic?

What caused you to feel that way?



Before you begin this section make a note on the following question:

Think about a learner in a recent class who appeared lost, or confused... What are some reasons why they may have appeared that way?

How can you apply this in your online classroom?

Strategy 1

Provide learners in advance with the aims and outcomes of the lessons and why (don't surprise learners!).

Strategy 2

Provide digital course or lesson outlines with editable space for learners to add their own notes, reflections or ideas; to encourage them to make connections themselves. Guide learners to set personal learning goals which they can check at the end of the lesson, week or course.

Strategy 3

Create a visual diagram of how the lesson fits together (e.g. an animated pyramid diagram or flowchart) which you complete as you work through the lesson to help show the cumulative nature of a lesson.

Principle 3: Activate the different senses

What is this principle?

We often present information with one modality (e.g. written or verbal) but the brain makes more connections (and therefore retains information better!) when more parts of the brain are activated.

Using the different senses in our lessons means that more parts of the brain are activated at a time. This is called multisensory learning.

Multisensory techniques help to convey information through the different senses like touch, smell, taste and movement. This can make it easier for learners to make new connections, collect information or retain information.

How does this benefit our learners?

Multisensory learning is great for all learners as using multiple senses can help information to stick, but it can be especially useful for learners who struggle with visual or auditory processing and find reading or listening particularly challenging. Many learners, especially learners with dyslexia, need to feel and see what they are learning in order to understand.

Using the senses is important, but we also need to manage how we use them. To avoid overloading students, make sure you scaffold and monitor the lesson. Some SEN learners can become overwhelmed by too much environmental stimuli (e.g. loud background noise, more than one person talking at a time, reading and listening at the same time).



Prepare to discuss:

What are some challenges to activating the different senses in your learning context?

What are some benefits?



Before you begin this section make a note on the following questions:

What are your favourite smells, or scents? Why do you like these smells? What memories do they evoke?

How can you relate this to the classroom?

How can you apply this in your online classroom?

When presenting new information, think about ways learners can explore this information using different senses.

Strategy 1

Give learners a task that requires them to move around their remote environments and present ideas back to the class. If possible, ask learners to use their smartphones to take pictures or videos?

Strategy 2

Combine reading with another sense. For example, reading and body movements (e.g., percussion or clapping), or reading and sound (e.g. music or melodies).

Strategy 3

Assign homework with real life tasks. For example, instruct learners to eat a meal and then write about it.

Strategy 4

Experiment with using scents to promote memory (scent, memory and learning have been found to be closely linked in the brain). For example, during a task ask learners to name a scent they can smell in their environment. Then, one week later, ask learners to reflect if associating the smell with the task helped their recall.

Check your understanding

Draw a line between the principle, strategy and benefits to make groups. Include one principle, one strategy, and one benefit for each group.

Then make a note for each group with an idea of which learners in your class would benefit from this, or a challenge you see with using this strategy.

Principle	Strategy	Benefit
1. Break down information	a. Provide learners with a visual outline of the course or lesson with space to record their own notes.	a. Improve memory by making information easier to digest.
2. Show the big picture	b. Ask learners to use real life objects and examples from their environment in tasks.	b. Support students to form connections between information.
3. Activate the different senses	c. Present content in small pieces that are organised in a logical way.	c. Activate more parts of the brain to support memory.

◆ Answer:
1,c,a. 2,a,b. 3,b,c.



Apply to your classroom

Think about an activity that you are planning to do with your class in the next week. Make notes about:

What changes can you make to:

- ◆ break down information
- ◆ show the big picture of the lesson
- ◆ activate the different senses

Make some notes to share with in your group discussion on:

- ◆ the changes you will make
- ◆ the benefits for your learners
- ◆ any challenges you see with using this strategy



Nice work. You're done for today! Your next task is to meet your group to discuss your ideas from the module.



Reflect on the module as a group

Welcome to your group discussion for Module 4 on inclusive interactions. This is a self-facilitated peer-learning session. Please follow the guide to go through the activities. Nominate a person for each letter A, B or C.

When it is your turn, lead the activity by reading the instructions aloud to the group and ask any questions. See below for details of each activity.

Note: *The group discussion is a powerful way to share ideas and build a sense of community and accountability around inclusivity at your school. However, if you're not able to join a group discussion in your context, the activities can also be completed alone as reflection and review tasks.*

Activity leader	Activity name	Time
Teacher A	Check in and introductions	5 minutes
Teacher B	Group review	10 minutes
Teacher C	Group reflection	15 minutes



Check in and introduction led by Teacher 'A'

Before you begin, prepare for the session with a 'check in'. A check in is a short pause at the beginning of a meeting to reflect on how you feel at this moment.

It might be that you have just had a very stressful class, or maybe you were running late today and feel in a rush. Sharing with the group helps to build empathy. When we have shared, we are ready to begin the discussion.

Take a moment to look at the fruit. Which fruit are you today, and why? Then introduce yourself: tell the group your name and which fruit you feel like and why.



Spend about
 5-minutes
 on this section.

Review – led by Teacher 'B'

Choose a strategy and take turns and tell each other one or two things about this strategy.

- ◆ Break down information;
- ◆ Show the big picture of the lesson;
- ◆ Activate the different senses.



Spend about
 10-minutes
 on this section.

Reflection – led by Teacher 'C'

Discuss the following reflection questions from the module as a group.

- ◆ Working memory, emotions, noise and distractions can be barriers to our ability to engage with information effectively.
 Can you think of a time when your learners have experienced more than one barrier at the same time? What barriers were they?
 What was the impact of the multiple barriers?
- ◆ Have you ever felt lost, or confused while learning a new topic?
 What caused you to feel that way?
- ◆ What are some challenges to activating the different senses in your learning context? What are some benefits?



Spend about
 15-minutes
 on this section.

If you're interested in this topic check out the links for further reading:

- ◆ Newman, I. (2019). When saying 'go read it again' won't work: Multisensory ideas for more inclusive teaching & learning. *Nurse Education in Practice*, 34, pp.12–16. doi:10.1016/j.nepr.2018.10.007. Available at: <https://www.sciencedirect.com/science/article/abs/pii/S1471595318302877>



Toolkit for inclusive teaching strategies

How to differentiate learning online

Module 6

Index

Start here!

You have six sections to complete in Module 6:

- ◆ Introduction
- ◆ Principle 1: The content: what learners learn
- ◆ Principle 2: The process: how learners learn
- ◆ Principle 3: The product: how learners demonstrate their understanding of the knowledge or skills
- ◆ Apply the strategies
- ◆ Put it into practice

Then we recommend you set up a group discussion to:

- ◆ Reflect on the module



Before you begin, we recommend that you get yourself a notebook for taking notes as you work through the toolkit.

Introduction

What's Module 5 about?

Case study

Before we start, read the case study. Do you have any students in your class like Sandra.



— **Sandra** is extremely frustrated with school.

— Although she makes some effort to study, she is still falling behind.

— Right now, Sandra is very stressed as she has a written exam tomorrow, but the only learning materials available to Sandra are her textbooks which are above her reading level, and her own notes which are poorly written and organised.

Why do we need to differentiate online learning?

Differentiation means adjusting your lessons for the different needs of your learners.

Differentiation could involve changing the content, delivery, or methods of learning - to ensure that every person learns in a way that works for them.

Differentiation in teaching is important because (as Sandra might tell you) a one-size-fits-all approach doesn't work.

In this module, you'll read three principles for differentiating, and strategies to use in your upcoming classes. You may already be using many of these techniques in your online classroom.

The strategies in this module are especially beneficial for boosting engagement and enhancing motivation to learn, while also allowing learners to take more responsibility for their learning.

Are you ready to start?

Take out your notebook.

As you go through this module, take notes on:

- ◆ What inclusive strategies you already use;
- ◆ Anything you hadn't considered before;
- ◆ What other small improvements you can make to create a more inclusive practice in your classroom.

Principles and strategies

Read about three principles that lead to your learners feeling more engaged and the strategies for using them in your classroom.

Principle 1 – The content: what learners learn

What is this principle?

Often our learning material consists of readings, and content-heavy presentations.

Differentiating content means providing different ways to access the learning material. By having different options (e.g. slides with text, links to video clips, audio recordings, and graphics), learners can choose how they learn.

The first step when considering how to differentiate in the classroom is to get to know the students in your classroom. One way to do this is to interview your learners about their favourite ways of learning and how confident they feel completing certain tasks.

How does this benefit our learners?

By providing a variety of ways to access information, learners who struggle with phonological processing don't need to only rely on written texts for comprehension.



Prepare to discuss:

On a scale of 1-10, how good are you at accessing and understanding printed text?
(1 = not good, 10 = very good)

Now, imagine you had given yourself a score of 1...

How would you feel in your most recent lesson?

What could you do to make this lesson more inclusive?



Before you begin this section make a note on the following question:

Think back to your last lesson...

What percentage of the learning content was written?

What percentage was audio?

How can you apply this in your online classroom?

Strategy 1

Vary the way you present information in class. For example:

- ◆ Include screenshots and images throughout a presentation for visual aids
- ◆ Engage learners with your voice, body language and by using real-life objects where appropriate

Strategy 2

Try recording a video of yourself presenting what was previously written content, so that learners can read, see and hear the presentation. These presentations are reusable for future classes too! Being able to access the video before or after the session will have added benefits for learners who need adjustments to pace and schedule, too.

Principle 2 – The process: how learners learn

What is this principle?

How do your different learners understand or make sense of information, ideas and skills?

This principle is about considering different learning paces and preferences and adapting the digital learning environment accordingly.

Some learners pick things up quickly, while others need more time. Often in a traditional classroom, tasks are completed in a set amount of time, which can mean faster learners can feel held up, and slower learners can feel rushed.

Every learner comes with their own preference for engaging with tasks. Some learners enjoy consolidating learning by discussing an idea, while others prefer to touch and explore concepts physically. Some prefer to work in groups, while others need independent study. And some students require the support of a teacher.

How does this benefit our learners?

Using a flexible approach to the process gives learners more autonomy over their learning. It also helps SEN students feel like they're not falling behind or holding the lesson up, which can reduce confidence and self-esteem.



Prepare to discuss:

What are some challenges to differentiating 'the process' in your specific context?

What are some benefits?



Before you begin this section make a note on the following question:

Do all learners in your class work at the same pace?

How can you apply this in your online classroom?

Strategy 1

Set work to be asynchronous.

Strategy 2

Provide space for collaborating with other learners in groups.

Strategy 3

Plan to use break-out rooms (or 'stations' if teaching a physical class) with different inputs. Allow learners to choose a station depending on how they want to interact with the material.

Principle 3 – The product: how learners demonstrate their understanding of the knowledge or skills

What is this principle?

The 'product', or what learners produce, refers to how learners demonstrate their understanding of knowledge or a skill. For each task, offer more than one way in which learners can show their understanding.

For example, for a given task, you could give learners a choice to write an essay, or prepare a slide deck, or create a website, or submit a video, or submit an audio recording depending on their skills and preference.

You could also give learners options for how they produce the product. For example, using speech-to-text tools to help communicate ideas.



Before you begin this section read the following popular quote:

How much do you agree?

“Everyone is a genius. But if you judge a fish by its ability to climb a tree, it will live its whole life believing that it is stupid.”

How does this benefit our learners?

Offering different ways to demonstrate understanding benefits both learners and teachers by leading to a greater sense of ownership of product. It also allows learners to use their strengths, and further helps build the confidence of SEN learners by not forcing them to do what they're less able to.

Speech-to-text tools are useful in the online classroom and especially helpful for:

- ◆ learners who forget their ideas once they shift to writing
- ◆ learners who struggle with getting any words on the page at all (feeling unable to transfer their thoughts)
- ◆ learners who are anxious about their spelling and grammar



How can you apply this in your online classroom?

Different options for creating and sharing work online could include:

Strategy 1

Presenting work visually in a slide deck, or on a platform like Jamboard or Flipgrid.

Strategy 2

Submitting an audio or video recording answering the assignment using software like Loom

Strategy 3

Group work where learners take on roles related to their strengths.

Strategy 4

Give learners the option to hand in an 'offline' assignment. For example, completing a hands-on activity with materials from their home and taking a photo.



Prepare to discuss:

How can you find out from your learners about what works best for them?



Check your understanding



Draw a line between the principle, strategy and benefits to make groups. Include one principle, one strategy, and one benefit for each group.

Then make a note for each group with an idea of which learners in your class would benefit from this, or a challenge you see with using this strategy.

Principle	Strategy	Benefit
1. Differentiate the content...	a. by recording a short video reading a text aloud for learners to watch if they choose, so that...	a. learners feel a greater sense of ownership of output!
2. Differentiate the process...	b. by giving the option of submitting an essay or a mindmap with accompanying explanation, so that...	b. learners can complete tasks at their own pace..
3. Differentiate the product...	c. by setting tasks to be done asynchronously, so that...	c. learners who struggle with phonological processing are supported!

◆ Answer:
1,c,a. 2,a,b. 3,b,c.

Apply to your classroom

Think about an activity that you are planning to do with your class in the next week. Make notes about:

What changes can you make to differentiate:

- ◆ the content (what learners learn)
- ◆ the process (how learners learn)
- ◆ the product (how learners demonstrate their understanding of knowledge or skills).

Make some notes to share with in your group discussion on:

- ◆ the changes you will make
- ◆ the benefits for your learners
- ◆ any challenges you see with using this strategy.



Nice work. You're done for today! Your next task is to meet your group to discuss your ideas from the module.



Reflect on the module as a group

Welcome to your group discussion for Module 4 on inclusive interactions. This is a self-facilitated peer-learning session. Please follow the guide to go through the activities. Nominate a person for each letter A, B or C.

When it is your turn, lead the activity by reading the instructions aloud to the group and ask any questions. See below for details of each activity.

Note: *The group discussion is a powerful way to share ideas and build a sense of community and accountability around inclusivity at your school. However, if you're not able to join a group discussion in your context, the activities can also be completed alone as reflection and review tasks.*

Activity leader	Activity name	Time
Teacher A	Check in and introductions	5 minutes
Teacher B	Group review	10 minutes
Teacher C	Group reflection	15 minutes

Check in and introduction led by Teacher 'A'

Before you begin, prepare for the session with a 'check in'. A check in is a short pause at the beginning of a meeting to reflect on how you feel at this moment.

It might be that you have just had a very stressful class, or maybe you were running late today and feel in a rush. Sharing with the group helps to build empathy. When we have shared, we are ready to begin the discussion.

Take a moment to look at the traffic light. Which colour of the traffic light are you today? Then, introduce yourself: tell the group your name and share which colour you have chosen and why.



Spend about
5-minutes
on this section.



Review – led by Teacher ‘B’

Choose a strategy and take turns and tell each other one or two things about this strategy.

- ◆ Differentiating the content: what learners learn;
- ◆ Differentiating the process: how learners learn;
- ◆ Differentiating the product: how learners demonstrate their understanding of the knowledge or skills.

For example:

Since reading the module, have you used any of the strategies?

Do you have any more examples of how this principle can be applied in the online classroom?

Have you used any of these in your online classroom? Was it successful?



Spend about
10-minutes
 on this section.

Reflect – led by Teacher ‘C’

Discuss the following reflection questions from the module as a group.

- ◆ On a scale of 1-10, how good are you at accessing and understanding printed text? (1 = not good, 10 = very good).

Now, imagine you had given yourself a score of 1. How would you feel in your most recent lesson? What could you do to make this lesson more inclusive?

- ◆ What are some challenges to differentiating ‘the process’ in your specific context? What are some benefits?
- ◆ How can you find out from your learners about what works best for them?



Spend about
15-minutes
 on this section.

If you're interested in this topic check out the links for further reading:

- ◆ Lawrence-Brown, D. (2004). Differentiated Instruction: Inclusive Strategies for Standards-Based Learning That Benefit the Whole Class. *America Secondary Education* [online] Available at: <https://knilt.arcc.albany.edu/images/b/b9/Brown.pdf> [Acceso el 21 Nov. 2022]
- ◆ eLearn Magazine, an ACM Publication. (2019). *eLearn Magazine: Engaging Learners in Online Environments Utilizing Universal Design for Learning Principles*. [online] Available at: <https://elearnmag.acm.org/featured.cfm?aid=3310383>



Toolkit for inclusive teaching strategies

How to build belonging online

Module 7

Index

Start here!

You have six sections to complete in Module 7:

- ◆ Introduction
- ◆ Principle 1: Represent learners and their lived experiences
- ◆ Principle 2: Support learners to bring their ‘whole-self’
- ◆ Principle 3: Develop emotional resilience
- ◆ Apply the strategies
- ◆ Put it into practice

Then we recommend you set up a group discussion to:

- ◆ Reflect on the module



Before you begin, we recommend that you get yourself a notebook for taking notes as you work through the toolkit.

Introduction

What's Module 7 about?

Case study

Before we start, read the quote from Marian Wright Edelman, Founder and President of the Children's Defense Fund.



©National Association of Countries.
Photo by Jessica Yurinko

How does this relate to a learner feeling like they belong in your classroom?

'You can't be what you can't see.'

Why do we need to build belonging online?

'Belonging' is the feeling of connectedness to a group or community. When we feel that we belong we feel safe in our identity and able to express ourselves.

Feeling a sense of belonging means that learners are more motivated, healthier, happier and achieve higher grades.

But according to research, one in four young people don't feel that they 'belong' in school and creating a sense of belonging in the online classroom is arguably more challenging than in a traditional classroom.

In this module we'll look at how to make your online environment more inclusive to help learners feel they belong.

You may already be using many of these techniques in your online classroom, if so, take note of what is already working and areas you might be able to adjust.

Are you ready to start?

Take out your notebook.

As you go through this module, take notes on:

- ◆ What inclusive strategies you already use;
- ◆ Anything you hadn't considered before;
- ◆ What other small improvements you can make to create a more inclusive practice in your classroom.

Principles and strategies

Read about three principles that lead to your learners feeling a greater sense of belonging, and strategies for using them in your classroom.

Principle 1: Represent learners and their lived experiences

What is this principle?

By representing a wide range of learners and lived experiences in the materials we teach, we can give learners a range of role models, help learners see themselves in others, and make the idea of success more tangible.

Online learning is an opportunity to look beyond the textbook and provide a more diverse set of resources and perspectives to learners that represent different identities, experiences and issues (e.g., emotions, learning or home life).

How does this benefit our learners?

Motivation and engagement is increased when we're able to 'see ourselves' in the learning material.

Learning about different perspectives and worldviews also helps to develop critical thinking skills and tolerance within our classrooms.



Prepare to discuss:

How might you create opportunities for learners to connect learning to their culture, interests and things that matter to them?



Before you begin this section make a note on the following question:

What identities do your learners bring to your classroom?

For example, 'I identify as dyslexic', or 'I identify as the oldest sister in my family'.

How can you apply this in your online classroom?

Strategy 1: Invite learners to contribute to lesson planning:

- ◆ Learners can find, co-create or decide on additional materials or tasks
- ◆ Provide opportunities for learners to give feedback privately if they feel excluded or need support (e.g., using a Google form)

Strategy 2: Make content local

Find examples online of local English speakers (e.g., podcasts) with the learners' first language to give attainable role models

Strategy 3: Personalise tasks to be about your learners' own experiences

If possible, integrate social media into the lessons to add authenticity

Principle 2: Support learners to bring their 'whole-self' to the lesson

What is this principle?

Often people feel they must 'be a certain person' in a learning environment. They feel restricted, even frightened, to be their true selves. Learning environments can be daunting places, especially for those who feel – for whatever reason - that they don't 'fit in'.

This principle is about supporting learners to bring their 'whole-self'; to feel comfortable in expressing who they are, how they feel, and how they relate to learning.

How does this benefit our learners?

All learners can benefit from bringing their whole self. One of the worst things about school can be the feeling that a child cannot be themselves. This often leads to 'masking', an act that reduces a learner's ability to learn, taking up vital emotional energy and thinking.

By allowing learners to be open about how they are feeling, what they're happy or worried about, is an important way of both relationship building and helping to feel positive about learning. Adopting a whole-self mindset can be liberating and help with a learner's mental health.

Furthermore, it becomes easier for the teacher to prepare personalised lessons based on who the students are; and personalised learning is far more engaging than learning that feels impersonal and distant.



Prepare to discuss:

How might your different learners' identities affect their ability to express themselves?



Before you begin this section make a note on the following question:

Think about a place you feel comfortable to be yourself... What is it about that place that allows you to feel yourself?

How can you apply this in your online classroom?

Strategy 1

Use check-in activities with your class. A check-in is a short activity at the beginning of a lesson that answers the question "how are you feeling?" in a more creative and safe way.

- ◆ Learning to express feelings can be difficult (for many reasons). Consider safe ways to introduce the check-in. Explain why you're doing it and model yourself (keep it short!). Encourage participation, but don't force learners.
- ◆ Try non-verbal check-ins. For example, using a digital whiteboard, ask learners to choose an animal they associate themselves with today, what colour they feel, or draw an avatar that represents them.
- ◆ For large groups consider using the chat function, or break-out rooms.

When done well and done regularly, check-ins can strengthen remote learners' connection with one another; improving trust, culture and communication (and removing feelings of awkwardness). There are examples of 'check-in' activities in the discussion section of each toolkit module.

Principle 3: Develop emotional resilience

What is this principle?

Developing emotional resilience means developing the ability to overcome stressful, challenging and sometimes traumatic experiences in our lives.

'Stressful' situations for our learners can range from large-scale traumatic events (e.g., school closures during the COVID-19 pandemic) to the day-to-day stress of school life.

The online classroom may add to feelings of isolation, confusion and loneliness, which in turn will affect their wellbeing and ability to learn. Emotional resilience can help to combat this.

Emotional resilience can follow a process of:

- ◆ recognising when we're experiencing emotions
- ◆ labelling the emotion
- ◆ contextualising the emotion to be less damaging or reframing our response to the emotion.

How does this benefit our learners?

Learning success can be affected by our emotional state. Self-generating positive emotions and self-regulating negative ones can help learners focus and learn better.

Developing emotional resilience in SEN learners who may have difficulties managing their emotions is particularly important to avoid learners becoming overwhelmed.



Prepare to discuss:

- What are some challenges to developing building emotional resilience in your specific context?
- What are some benefits?



Before you begin this section make a note on the following question:

Do your learners learn better when they are happy or stressed? Why?



How can you apply this in your online classroom?

Strategy 1

Create time and space to journal emotions. Provide prompts like 'write down one thing to be grateful for'.

Strategy 2

Set up online peer learning networks to build space for connection.

Check your understanding

Review the strategies suggested throughout this module and add the most useful ones for your context to this table. Make a note for each group with an idea of which learners in your class would benefit from this, or a challenge you see with using this strategy.

What other strategies do you have to help learners facing these barriers?



Potential emotional barrier experienced by learners	Strategy you can use to build belonging online	Principle behind strategy
Unmotivated to learn from textbook		Represent learners and their lived experiences
Lack of confidence, feeling like an outsider		Support learners to bring their 'whole-self'
Overwhelmed by the stress of school		Develop emotional resilience

Apply to your classroom

Think about an activity that you are planning to do with your class in the next week. Make notes about:

What changes can you make to:

- ◆ represent learners and their lived experiences
- ◆ support learners to bring their 'whole-self'
- ◆ develop emotional resilience

Make some notes to share with in your group discussion on:

- ◆ the changes you will make
- ◆ the benefits for your learners
- ◆ any challenges you see with using this strategy



Nice work. You're done for today! Your next task is to meet your group to discuss your ideas from the module.



Reflect on the module as a group

Welcome to your group discussion for Module 4 on inclusive interactions. This is a self-facilitated peer-learning session. Please follow the guide to go through the activities. Nominate a person for each letter A, B or C.

When it is your turn, lead the activity by reading the instructions aloud to the group and ask any questions. See below for details of each activity.

Note: *The group discussion is a powerful way to share ideas and build a sense of community and accountability around inclusivity at your school. However, if you're not able to join a group discussion in your context, the activities can also be completed alone as reflection and review tasks.*

Activity leader	Activity name	Time
Teacher A	Check in and introductions	5 minutes
Teacher B	Group review	10 minutes
Teacher C	Group reflection	15 minutes



Check in and introduction led by Teacher 'A'

Before you begin, prepare for the session with a 'check in'. A check in is a short pause at the beginning of a meeting to reflect on how you feel at this moment.

It might be that you have just had a very stressful class, or maybe you were running late today and feel in a rush. Sharing with the group helps to build empathy. When we have shared, we are ready to begin the discussion.



Spend about 5-minutes on this section.

Take 15 seconds to draw a simple shape that represents you today. Then introduce yourself: tell the group your name and show the group your shape, giving a very short description.

Review – led by Teacher 'B'

Choose a strategy and take turns and tell each other one or two things about this strategy.

- ◆ Differentiating the content: what learners learn;
- ◆ Differentiating the process: how learners learn;
- ◆ Differentiating the product: how learners demonstrate their understanding of the knowledge or skills.

For example:

Since reading the module, have you used any of the strategies?

Do you have any more examples of how this principle can be applied in the online classroom?

Have you used any of these in your online classroom? Was it successful?



Spend about 10-minutes on this section.

Reflection – led by Teacher 'C'

Discuss the following reflection questions from the module as a group.

- ◆ How might you create opportunities for learners to connect learning to their culture, interests and things that matter to them?
- ◆ How might your different learners' identities affect their ability to express themselves?
- ◆ What are some challenges to developing building emotional resilience in your specific context? What are some benefits?



Spend about 15-minutes on this section.

If you're interested in this topic check out the links for further reading:

- ◆ Riley, K., Coates, M. and Allen, T. (2020). Place and belonging in school: *Why it matter today*. [online] National Education Union. Available at: <https://neu.org.uk/place-belonging>
- ◆ Zhang, Q., Zhou, L. and Xia, J. (2020). Impact of COVID-19 on Emotional Resilience and Learning Management of Middle School Students. *Medical Science Monitor*, 26. doi:10.12659/msm.924994. Available at: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7485285>

